

AMSAT SATELLITE REPORT

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AMSAT Speakers Featured At ARRL Event

AMSAT and amateur satellite activities were on display 23-26 July in Cedar Rapids, Iowa at the ARRL National Convention. The three-day event brought together thousands of amateurs from around the nation and dozens of the leaders of the amateur radio community. The ARRL Directors had met for the previous four days at the 5 Seasons Center in downtown Cedar Rapids.

AMSAT was well-represented by a contingent of East-coast HQ delegates as well as prominent AMSAT managers from the mid-west. AMSAT Iowa Area Coordinator Ralph Wallio, W0RPK, did a first-rate, professional job in organizing the AMSAT activities, setting up the booth, lining up the materials and generally insuring things ran according to plan. Ralph's superb efforts resulted in the entire weekend coming off without a single hitch!

Heading up the AMSAT HQ contingent was President Tom Clark, W3IWI. Tom was featured speaker at Sunday's satellite seminar session. Executive Vice President Vern "Rip" Riportella, WA2LQQ, attended the convention wearing all three of his official caps: VP, *Orbit* Editor and ASR Editor! Jim McKim, W0CY, AMSAT's Chief Area Coordinator, joined in making the event a memorable one. Jim is one of the veterans of AMSAT and since his recent retirement has upgraded his participation. Jim is also NCS for the Mid-America 75 meter AMSAT net on Wednesdays (UTC). Colorado Area Coordinator Bill McCaa, K0RZ, did yeoman duty at the booth and his Apple computer satellite tracking program was a real eye-catcher and conversation piece.

The major draw of the weekend for satellite aficionados was the three-hour AMSAT forum beginning at 9:00 AM Sunday morning. W0RPK led off the program with beginner-level topics using slides and viewgraphs to illustrate his talk. Following W0RPK, K0RZ spoke on how he managed to automate his station using his Apple computer to track the satellites by automatically pointing the antennas, switching the rigs on and generally preparing things for a QSO. Bill explained how his efforts at auto-Doppler correction were frustrated by erratic operating procedures of "normal," human operated stations. Finally, W3IWI presented a set of intriguing slides on the Phase III program. Many of the slides had not previously been seen in public and were the subject of intense interest from the audience which numbered be-



Some of the "Booth-Tenders" at the recent ARRL Convention in Cedar Rapids. Left to right: W0RPK, K0RZ, W3IWI, W4DAQ, W0RUE.

tween 80 and 90. Tom's slides featured all of the Phase IIIB hardware, many of the builders of the bird and some interesting slides of the recent thermal vacuum testing of Phase IIIB. A question and answer period followed.

The booth traffic was brisk with many fellow AMSAT members stopping by to chat and exchange views and reminiscences. Dozens of satellite folk came to the booth to meet the staff and to discuss their feelings on AMSAT-related issues.

ASR congratulates W0RPK, W3IWI, K0RZ on a job well-done. To the booth crew including W4DAQ, K0CY, W0RUE and others, thanks. ASR extends especially warm thanks to W0YZC for his hospitality! And to all the ARRL Directors who came by the booth to express support, our continued appreciation. A special note of thanks to W1QV for his superb efforts in AMSAT's behalf. Vy FB indeed!

New Net Voices On Tap

AMSAT Net Manager, Wray Dudley, W8GQW, has announced two additions to the NCS roster. The new stations are W1KK, Art Zavarella, of Agawam, MA and N3AR, Ron Schwendt, of Douglassville, PA. These individuals will be integrated in the rotation for the weekend 20 and 15 meter AMSAT International Net on Sundays. Watch for them soon and welcome aboard to both our new NCS!

Project OSCAR Meetings

Two Project OSCAR meetings are in the news this week: one that has occurred and one that is planned for next week. First, a report on the meeting held 21 July.

The General Meeting of Project OSCAR was held as scheduled (ASR #37) at the Electronics Museum of Foothill College, Los Altos, California. President John Pronko, W6XN, conducted the meeting. Presenters included W6SP, WB6JNN, and Dr. Pronko. A special guest was Dr. Robert Leonard, KD6DG, Director of the Radio Physics Laboratory at SRI International. (See ASR #38). Bob reported on the progress of UoSAT salvage efforts undertaken at SRI and plans for future tries. (See related story in this issue.)

The business portion of the meeting included reports by the President, Treasurer and Secretary. The election of Officers followed. John Browning, W6SP, was elected Chairman of the Board of Project OSCAR. W6SP holds the chair in AMSAT as well as providing a unique bridge between the two organizations and perhaps boding still closer ties. The complete slate of nominated Directors was elected. In the technical presentation Jim Eagleson, WB6JNN, reported on progress on the SYNCART project which Project OSCAR has undertaken in league with AMSAT Canada.

A special meeting of Project OSCAR South, located in the Los Angeles region, will be held 14 August at 1300 PDST according to W6SP who will host the event. The meeting will be held at the Officers' Club, Los Angeles Air Force Station, El Segundo, California. The program includes a welcome by W6SP, a report on SYNCART by project leaders WB6JNN (of the RF-North contingent) and John Fail, KL7GRF/6 (of the Digital-South group). Following the SYNCART presentation special guests KE3D/ZS1FE and N3CHZ/ZS1KE, Gordon and Molly Hardman, will describe progress on the Phase IIIB spacecraft as well as plans for future amateur satellite space missions. Gordon and Molly are taking a leisurely tour across the U.S. which will take them to the Central States VHF Society Conference in Baton Rouge Louisiana on the weekend of 31 July-1 August. Later they will be stopping to visit with KO5I at his Northern Texas hacienda in Paris, Texas. After their stop in L.A., they'll be driving to San Francisco and then fly home to ZS from there.

Don't miss this meeting which, according to W6SP, will be an especially interesting one for all. Pass the word. Talk-in will be on AD6P/R at 144.88/145.48 and 145.55 simplex. You may call W6SP at 213-541-4997 for additional details as required. Thanks W6XN, W6SP!

AMSAT Seeks Professional Manager

The successful launch of AMSAT's first Phase III satellite in early 1983 will bring unprecedented growth to this primarily volunteer-managed organization. Phase III will require transitioning to a full-time professional Executive Director/General Manager. AMSAT is seeking a candidate who will:

- Develop and implement innovative educational



John Fail, KL7GRF, sits at one of the operating positions of his station in Luna Beach, California. The moon rise in John's shack adds considerable atmosphere. John leads the SoCal digital branch of Project OSCAR in the joint Project OSCAR-AMSAT Canada SYNCART Project.

programs to bring an awareness and appreciation of space science and technology at the personal level to amateurs and non-amateurs around the world.

- Manage and coordinate the work of hundreds of volunteers who design, build, launch and operate the worldwide amateur space communications system.

- Oversee the day-to-day operations of AMSAT involving membership services, publications, public information and staff management.

- Lead a comprehensive fund raising activity both inside and outside the Amateur Radio community.

This position is located in suburban, Washington, D.C. and will require some travel and weekend work. Compensation is in the \$30,000 per year range, with substantial performance based incentives. An engineering/technical background is desirable. Active Radio Amateur interest is mandatory. Send resumes to:

AMSAT Search Committee

P.O. Box 27

Washington, DC 20044

Deadline is November 1, 1982.

Calendar Updates

Latest correction factors to the Project OSCAR orbital prediction calendar are given as follows calculated for 1 Aug. 82:

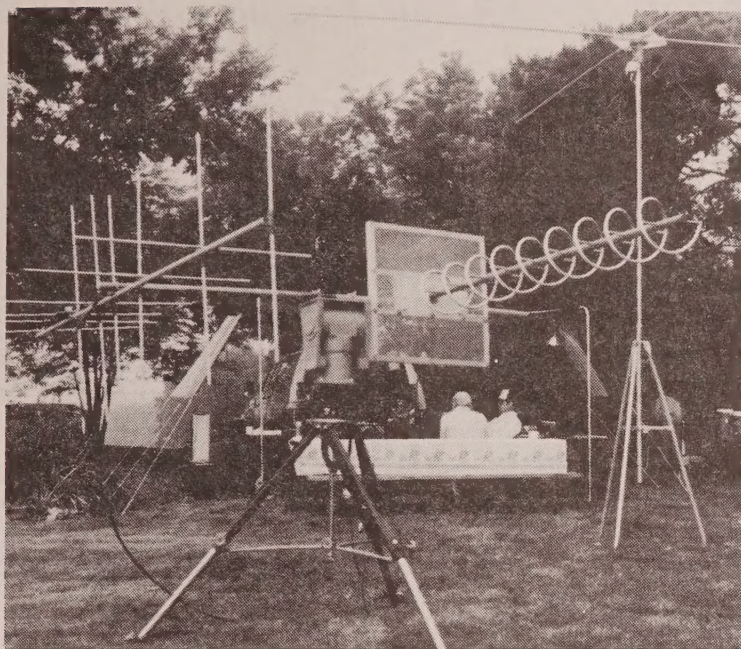
(Please add the following values to the times given in the tables)

AO-8, +116; RS-3, +39; RS-4, +14; RS-5, -68; RS-6, -7, RS-7, +28; RS-8, +27.

All values are time in seconds to be added.

UoSAT-OSCAR 9 reference orbit for 1 Aug.: 00:05:47 @ 135.6 W.

Differentials are computed based on latest NASA observations.



Some of W0RPK's antennas, shown here during Field Day, were on display at the ARRL National Convention in Cedar Rapids.

W4BE Wins "Chicken Little" Contest

Buzz Eggebrecht, W4BE, of Port Richey, Florida has won the "Chicken Little" contest by most accurately predicting the fall from orbit of ISKRA-2. (See related story elsewhere in this issue.)

Buzz's winning guess was off by -5.00 hours but was good enough to win him the prize of a brand new 70 cm crossed yagi antenna. Buzz's entry was postmarked 1 July 82, AM, and his guess was 8 July, 19:19:19 UTC. The actual deorbit time was given by official sources consulted by AMSAT as 00:19 UTC, 9 July. (The actual time given was a window in which 00:19 was the center, most likely time of occurrence.) Thus Buzz's entry was nearly exactly 5 hours off. Note the preponderance of "19s" in the guess and the correct time! Buzz probably worked the hardest of any of the entries filing no fewer than 13 guesses between 1 July and 13 July. He won, however, with his very first entry!

A close second was scored by Ed Koskie, N2EK, of Kingston, New York. Ed's guess of 0600 UTC, 9 July missed by +5.68 hours. Other close guesses were filed by Stan Moffatt, ZL3CU, 3rd place, -6.22 hours; Don, W1YCW, 4th place, +11.20 hours; Joe, N1BGA, 5th place, -22.78 hours.

The first report of ISKRA-2 telemetry loss came from PA0DLO who reported not hearing ISKRA-2 on 10 July when expected. Nico commented at the time that he thought ISKRA had a few more days since the period of the orbit was at that time about 88 minutes. Most experts expected the orbit decay to occur when the orbital period approached 86 minutes. Apparently the slide from 88 to 86 or 85 was much, much quicker than had been predicted. Other reports later filtered into AMSAT confirming that 9 July had been the date of last observation of the satellite's beacon. It was not clear until last week that the satellite had decayed from orbit concurrent with the loss of telemetry reported to have occurred on the 9th. In fact, AMSAT officials had cautioned against concluding absolutely that both telemetry loss

and decay had been concurrent since the period on the 9th was well above the lowest period thought to be sustainable for a matter of days. A reasonable alternate hypothesis was offered which suggested that atmospheric heating associated with the increased velocity of ISKRA-2 had caused the telemetry failure. It now seems clear that the interval between beacon failure due to atmospheric heating and actual decay of the orbit was measured in seconds and minutes rather than hours and perhaps days as had been speculated based on the 88 minute period at that time.

Some of the most interesting data submitted, although it did not comprise an official contest entry, came from our colleagues in Japan. A team comprised of JA7IE, JR2DBE, J2WO and led by JR2BQN provided ASR with graphs depicting period versus orbit number and height versus orbit number. The graphs clearly show the exponential nature of the orbital decay function. Moreover, the team cites orbit #840 as the exact orbit in which decay occurred. ASR has not confirmed this as fact but JR2BQN's team seems to have made a case for #840 as being ISKRA's last go-round. ASR especially congratulates Mr. Rikizo Imaizumi, JR2BQN, and his team for the exceptional manner of their research. Although not entered in the contest, these individuals clearly participated in the spirit of the contest, that is, the application of space science techniques to amateur radio satellites.

ASR congratulates W4BE and all entries in this fun contest.

Phase IIIB Moves Towards Launch

The Phase IIIB spacecraft was shipped from the AMSAT lab on Friday, 30 July, and has arrived in Germany thus taking a major step towards its historic launch to orbit early next year. The spacecraft recently underwent rigorous thermal-vacuum tests at the Goddard Space Flight Center. During the course of these tests two malfunctions occurred. The malfunctions were revealed in the transponders (one fault each in the Mode B and Mode L transponders) and were consequently returned to Germany with the AMSAT DL crew which attended the thermal-vacuum tests. Back in the Marburg lab where they were built, AMSAT DL engineers quickly diagnosed the failures and had remedies in hand shortly thereafter. The fixes amounted to a minor redesign in the circuits.

Now the entire spacecraft will be re-integrated and prepared for shake and vibration testing but not before the transponders are again subjected to thermal-vacuum testing at the subsystem level. These units will then be potted as were the balance of units which remained at Goddard when the transponders returned to Germany with the DL crew. The shake-vibe tests are now scheduled for the last week in September at a facility in Marburg. At press time the launch schedule was holding with L5 set for 10 Sept. 82, L6 for second half of November and L7 for January 83. However, as has been mentioned in these pages on occasion, any slips in L5 and L6 will likely ripple through the schedule to affect L7.

Arianespace Moves To Corner Market

Arianespace is the European consortium formed to market the launch services of the Ariane rocket developed by ESA, the European Space Agency. An intense competition has evolved between Arianespace and the U.S. Space Shuttle. The competition is for customers. Satellite builders/users are highly critical of the Shuttle claiming that they can place their payloads in orbit far less expensively using Ariane than the shuttle. This despite the fact that the Ariane is expendable (not reusable) and the shuttle can be reused at least a hundred times or more. U.S. authorities counter that massive government subsidies in terms of very favorable financing agreements are the main factor in tilting the balance toward Ariane. What ever the real reason may be Arianespace has been enormously effective in marketing its launch services despite the setback on LO2 and the current delays resulting from a payload design problem. The problem with the payloads is not a result of any factor in the launch vehicle itself but rather the so-called "plasma sheath" problem which arose on MARECS-A (See ASR #30).

Evidently the commercial satellite folks are confident enough in Ariane to place hundreds of millions of dollars in hardware and launch fees on the line. In just the first five months of 1982 Arianespace booked 10 new launches bringing their bookings to 24. The business boom has caused Arianespace to redouble their efforts at Kourou, French Guiana to complete the second launch pad. Current plans call for operations from the second pad to commence in 1985. Recent additions to the Ariane bookings include Direct Broadcast Satellite (DBS) Corp., Telesat Canada, Swedish Space Corp., INTELSAT, CNES, United Satellite Limited (UK). Tks KA1M.

SRI-UoSAT Effort Moves to 2 Meters

As reported in ASR #38, the 46 meter (150 foot) dish at SRI International was turned to track UoSAT recently. According to Project leader Dr. Bob Leonard, KD6DG, the initial "bugs" in the system were successfully banished and several good tracking runs were made. However, the UO-9 satellite did not respond to commands directed to it from the SRI transmitter. It is thought that the negative result is at least partially attributable to the fact that UoSAT's 2 meter command receiver has precedence over the 70 cm command receiver. The recent SRI effort concentrated on the 70 cm mode while the UO-9 was well out over the Pacific Ocean such that the amplitude of stray 2 meter signals UO-9's receiver was exposed to were sharply attenuated. Despite this strategy the efforts on 70 cm to date have proved unsatisfactory. The next major effort will therefore involve command attempts on 2 meters. At press time the station at SRI was being reconfigured to use 2 meters.

CRRL OSCAR Talk Features WB1EYI

Steve Place, WB1EYI, ARRL's Club and Training Manager was a featured speaker recently at the Canadian Radio Relay League's (CRRL) Mid-West Convention.

The three day event was held 1-3 July in Saskatoon, Saskatchewan. Steve's talk included descriptions of past satellites, their construction, operation and interesting anecdotes about them. Colorful slides provided detailed images of the hardware Steve described to the mixed audience. Although many in the audience had been on the birds, quite a number had only heard the downlinks. Another group was just beginning to explore the topic.

Following the slides, which covered OSCAR 1 through Phase IIIA, Steve spoke about future plans for amateur satellites including Phase IIIB, C and beyond. According to observers the talk was well-received and served to amplify interest in both the veterans and new-comers alike. Thanks VE3EFX.

ASR sincerely solicits reports of activities of interest to the satellite community occurring in your region. If we are unaware, we cannot report on the events. Foreign news is especially welcome!

"Spark" Bird Dies Near Canaries

The newest amateur radio satellite, ISKRA-2, fell from orbit on 9 July just northwest of the Canary Islands. The demise of ISKRA, Russian for spark, had been predicted for late June or early July.

ISKRA-2's birth was unique in the annals of amateur radio satellites, generally referred to as OSCARs. ISKRA-2 was manually expelled from the airlock of the manned Russian space mission Salyut 7 on 17 May. The 28 kg (62 pound) student-built satellite apparently never fulfilled its primary objective of providing a 21 to 29 MHz linear transponder. However, the beacon of ISKRA-2 signing RK-02 had been prominent in the 10 meter band throughout its short life. (See background in ASR #33)

ISKRA-2 was in an orbit similar to early OSCARs such as OSCAR 1 which remained in orbit 50 days. ISKRA-2 lasted 53 days. There has been no public comment from the Soviet Union or the Central Radio Club of the USSR as to the nature of the failure which precluded transponder operation. (See ASR #38)

Rare Province Back On

Serge, VE1KG, reports he has rebuilt his station and is again active on Mode A. Look for him on all the Sputniks. His Nova Scotia QTH is one of the most sought. OX3WS in Greenland is also active on the RS's operating ssb.

Note: The next installment of Phase III Countdown *The Attitude Control System* will appear in a future issue as space allows.